

REMARKS

The Final Office Action mailed July 20, 2006, has been received and reviewed. Claims 35 through 38, 41 through 47, 49 through 51, 53 through 55, 57, and 58 are currently pending in the application. Claims 35 through 37 and 41 through 46 are withdrawn from consideration. Claims 38, 47, 49 through 51, 53 through 55, 57, and 58 stand rejected. Applicant respectfully requests reconsideration of the claims based upon the Remarks herein.

Rejections of Claims 38, 47, 49, 51, 53, 55, and 57

Applicant notes that the 35 U.S.C. § 102(e) rejection of claims 38, 47, 49, 51, 53, 55, and 57 includes statements which indicate that the actual rejection is an obviousness rejection. For example, the Final Action includes statements such as: "This rejection under 35 U.S.C. § 103(a) might be overcome by..." and "Thus it would have been obvious to one having ordinary skill in the art at the time the invention was made to...." *See, Final Action* at pp. 4 and 5 (emphasis added). These statements by the Office may be construed to indicate that the stated anticipation rejection of claims 38, 47, 49, 51, 53, 55, and 57 is actually an obviousness rejection under 35 U.S.C. § 103(a). Applicant responds to the rejection under 35 U.S.C. §§ 102(e) and 103(a).

35 U.S.C. § 102(e) Anticipation Rejection

Anticipation Rejection Based on U.S. Patent No. 6,657,736 to Raina et al., in view of U.S. Patent No. 5,909,635 to Marieb et al.

Claims 38, 47, 49, 51, 53, 55, and 57 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Raina et al. (U.S. Patent No. 6,657,736), in view of Marieb et al. (U.S. Patent No. 5,909,635). Applicant respectfully traverses this rejection, as hereinafter set forth.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *See, Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)(emphasis added). As admitted by the Office, Raina et al. fails to expressly or inherently describe each and every element of at least independent claims 38, 47, 51, and 55. In particular, the Final Action admits that "Raina et al. fail to disclose that the first part is forming a sheath completely wrapped around

an upper surface, lower surface a left edge, and a right edge of the second part [sic].” *See, Final Action* at p. 5. Similarly, Marieb et al. fails to describe, either expressly or inherently, each and every recitation of the independent claims. The failure of either reference to describe all of the recitations of the independent claims precludes an anticipation rejection of claims 38, 47, 49, 51, 53, 55, and 57 under 35 U.S.C. § 102(e).

Claims 38, 47, 51, and 55 are independent claims. Claim 38 includes, in part, the recitations “the conductor including a first part and a second part, the first part comprising chromium, the second part comprising aluminum, the first part being completely wrapped around the second part.” Although each of claims 47 and 51 are independently unique, they too include recitations similar to those of claim 38, namely, the recitations “the first part forming a sheath completely wrapped around an upper surface, a lower surface, a left edge, and a right edge of the second part.” Claim 55 also includes, in part, the similar recitations of “the first conductive material forming a sheath completely wrapped around at least a portion of the second conductive material and preventing the second conductive material from contacting the material comprising silicon.”

The Final Action admits that Raina et al. fails to describe the recitations of claims 38, 47, 51, and 55. The failure of Raina et al. to provide such description precludes an anticipation rejection of claims 38, 47, 51, and 55 under 35 U.S.C. § 102(e).

Marieb et al. also fails to anticipate independent claims 38, 47, 51, and 55. Marieb et al. at least fails to describe a “first part comprising chromium” as recited in claims 38, 47, and 51 and “a first conductive material comprising chromium” as recited in claim 55. The lack of such description precludes an anticipation rejection of any of claims 38, 47, 51, and 55 by Marieb et al.

The failure of Raina et al. and Marieb et al. to independently describe each and every recitation of independent claims 38, 47, 51, and 55 also precludes an anticipation rejection of dependent claims 49, 53, and 57 because the dependent claims inherit all of the recitations of the independent claims from which they depend.

For at least the foregoing reasons, claims 38, 47, 49, 51, 53, 55, and 57 are not anticipated by Raina et al. or by Marieb et al. Applicant respectfully requests the withdrawal of the 35

U.S.C. § 102(e) anticipation rejections of claims 38, 47, 49, 51, 53, 55, and 57.

35 U.S.C. § 103(a) Obviousness Rejection

Obviousness Rejection Based on U.S. Patent No. 6,657,736 to Raina et al., in view of U.S. Patent No. 5,909,635 to Marieb et al.

Claims 38, 47, 49, 51, 53, 55, and 57 apparently stand rejected under 35 U.S.C. § 102(e) as being anticipated by Raina et al. (U.S. Patent No. 6,657,736), in view of Marieb et al. (U.S. Patent No. 5,909,635) based upon obviousness arguments under 35 U.S.C. § 103(a). Applicant respectfully traverses this rejection, as hereinafter set forth.

The Final Action does not address Applicant's previous arguments with respect to the 35 U.S.C. § 103(a) obviousness rejection of claims 38, 47, 49, 51, 53, 55, and 57 based upon Raina et al. which is 35 U.S.C. § 102(e) art. In particular, the Final Action does not refute the fact that Raina et al. cannot be used as a prior art reference under 35 U.S.C. § 103(a) because it is disqualified as such under 35 U.S.C. § 103(c).

In response to the Action dated February 6, 2006, Applicant expressly provided a statement concerning common ownership of the pending application and Raina et al. In particular, the following statement was made:

The present application – U.S. Patent Application No. 10/671,332 – and U.S. Patent 6,657,376 to Raina et al., were, at the time the invention of the present application was made, owned by Micron Technology Inc. Furthermore, the inventor of the present application and the inventors of U.S. Patent 6,657,376 were at all times, including at the time that the invention of the present application was made, obligated to assign all rights in and to the inventions to Micron Technology Inc. *See, Amendment* filed May 4, 2006, at p. 9.

This statement is reasserted herein and is included as a separate statement in Appendix A, which is attached hereto. This statement is sufficient to disqualify Raina et al. as prior art for a 35 U.S.C. § 103(a) rejection under 35 U.S.C. § 103(c). *See, M.P.E.P. § 706.02(l)(2)*. Having provided such statement to the Office, the burden shifts to the Office to rebut the ownership statement or to withdraw the rejection.

In light of the disqualification of Raina et al. as prior art for the 35 U.S.C. § 103(a) obviousness rejection, Marieb et al. is the only reference upon which the rejection of claims 38, 47, 49, 51, 53, 55, and 57 under 35 U.S.C. § 103(a) is allegedly supported. Marieb et al., however, fails to teach or suggest all of the recitations of the claims. The failure of Marieb et al. to teach or suggest all of the recitations of the claims precludes a *prima facie* obviousness rejection. *See, Verdegaal Brothers v. Union Oil Co. of California*, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Marieb et al. at least fails to teach or suggest a “first part comprising chromium” as recited in claims 38, 47, and 51 and “a first conductive material comprising chromium” as recited in claim 55. The failure of Marieb et al. to teach or suggest such recitations precludes a *prima facie* obviousness rejection of claims 38, 47, 51, and 55 under 35 U.S.C. § 103(a).

Claims 49, 53, and 57 are dependent claims which depend from independent claims 47, 51, and 55, respectively. As dependent claims of nonobvious independent claims, claims 49, 53, and 57 are also nonobvious. *See*, M.P.E.P. § 2143.03 (*citing, In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)(if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious)).

Applicant respectfully requests the withdrawal of the alleged 35 U.S.C. § 103(a) obviousness rejection of claims 38, 47, 49, 51, 53, 55, and 57 based upon the 35 U.S.C. § 102(e) art of Raina et al. in combination with Marieb et al.

35 U.S.C. § 103(a) Obviousness Rejections

Obviousness Rejection Based on U.S. Patent No. 5,663,608 to Jones et al., and further in view of U.S. Patent No. 5,909,635 to Marieb et al.

Claims 47, 50, 51, 54, 55, and 58 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Jones et al. (U.S. Patent No. 5,663,608) and further in view of Marieb et al. (U.S. Patent No. 5,909,635). Applicant respectfully traverses this rejection, as hereinafter set forth.

A *prima facie* obviousness rejection based upon a combination of references can only be supported if there is some suggestion or motivation, either in the references themselves or in the

knowledge generally available to one of ordinary skill in the art, to modify or combine the reference teachings and if the combination of references teach or suggest all of the recitations of the claims. *See*, M.P.E.P. § 2142 (citing, *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)). No motivation exists to combine Jones et al. with Marieb et al. Further, the combination of Jones et al. with Marieb et al. fails to teach or suggest all of the recitations of the claims. The lack of motivation to combine the references, and the lack of teaching even when combined, precludes a *prima facie* obviousness rejection of claims 47, 50, 51, 54, 55, and 58.

“[I]t is fundamental that rejections under 35 U.S.C. § 103 must be based on evidence.” *See, In re Lee*, 61 U.S.P.Q.2d 1430, 277 F.3d 1338, 1342 (Fed. Cir. 2002). This evidence “must be based on objective evidence of record.” *Id.* at 1343. When patentability depends on a question of obviousness, “rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references” is “the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis.” *Id.* This rigorous showing requires the Examiner to “explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the claimed invention obvious.” *Id.* In other words, the motivation to combine can not “be resolved on subjective belief and unknown authority.” *Id.* at 1344. Furthermore, the Examiner “cannot rely on conclusory statements when dealing with particular combinations of prior art and specific claims, but must set forth the rationale on which it relies.” *Id.* at 1345.

The Final Action makes two allegations supporting its rational to motivate the combination of the references. First, the Final Action alleges that “it would have been obvious to one having ordinary skill in the art at the time the invention was made to wrap the second part completely by the first part as taught by Marieb et al. since this will prevent hillocking from all sides of the interconnect wire, thus prevents electromigration [sic.]” *See, Final Action* at p. 3. Second, in response to Applicant’s previous arguments, the Final Action alleges that “it is the teaching of surrounding the barrier metal all around the interconnect wire from Marieb et al. provides the support for the combination of references in *prima facie* obviousness rejection [sic.]” *Id.* at p. 6. Thus, the only support or evidence that the Final Action alleges as support for motivation to combine Jones et al. with Marieb et al. is the teachings of Marieb et al. and, in

particular, the teaching that wrapping or surrounding an interconnect wire will prevent hillocking and electromigration.

To provide a motivation or suggestion to combine, the prior art or the knowledge of a person of ordinary skill in the art must “suggest the desirability of the combination” or provide “an objective reason to combine the teachings of the references.” *See*, M.P.E.P. § 2143.01. The motivation alleged by the Office does not suggest an objective reason to combine Jones et al. with Marieb et al. While the teachings of Marieb et al., as recognized by the Office, may indicate that the wrapping of an interconnect prevents hillocking and electromigration, the teachings of Jones et al. express no desire to alleviate such problems, and in fact fail to even recognize that hillocking or electromigration problems may exist with the Jones et al. structures.

Hypothetically, if Jones et al. recognized that hillocking of its interconnect structures was a problem, then a combination of Jones et al. with Marieb et al. may be motivated because Marieb et al. could supply a solution to a problem recognized by Jones et al. The facts are, however, that Jones et al. does not recognize or even allude to problems with hillocking or eletromigration in its structures. Without some motivation in Jones et al. to seek out solutions to non-existent hillocking and electromigration problems that Marieb et al. may solve, an objective reason to combine Jones et al. with Marieb et al. does not exist.

The motivation alleged in the Final Action – elimination or reduction of hillocking and electromigration – does not support a combination of references unless it is also considered in view of Applicant’s specification, which constitutes improper hindsight. The only apparent, objective reason for combining Marieb et al. with Jones et al. are the suggestions of Applicant’s specification. Without the teachings found in Applicant’s specification and claims, a person of skill in the art would not combine Marieb et al. with Jones et al. The use of Applicant’s specification to motivate a combination of references is improper and does not support a *prima facie* obviousness rejection.

The lack of any suggestion or motivation to combine Marieb et al. with Jones et al. precludes a *prima facie* obviousness rejection of claims 47, 50, 51, 54, 55, and 58 under 35 U.S.C. § 103(a). *See, In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Even if there were sufficient motivation or suggestion to combine Jones et al. with

Marieb et al., which there is not, the combination of references fails to support a *prima facie* obviousness rejection because the combination of references does not teach or suggest all of the recitations of the claims.

Independent claims 47 and 51 each recite, in part, “a conductor...including a first part and a second part, the first part comprising chromium...the first part forming a sheath completely wrapped around an upper surface, a lower surface, a left edge, and a right edge of the second part.” Neither Jones et al., Marieb et al., or the combination of the two references teach or suggest at least “the first part comprising chromium...forming a sheath completely wrapped around...the second part” as recited in claims 47 and 51.

Jones et al. admittedly fails to teach or suggest all of the recitations of claims 47 and 51. In particular, the Final Action acknowledges that “Jones et al. fail to disclose that the first part is forming a sheath completely wrapped around an upper surface, lower surface, a left edge, and a right edge of the second part.” *See, Final Action* at p. 3. The Final Action also acknowledges the fact that Marieb et al. fails to teach or suggest that its “first part” is chromium as recited in claims 47 and 51; in particular, the Final Action states that the “examiner agrees that the sheath of Marieb et al. do not comprise chromium rather comprise barrier material such as titanium [sic].” *See, Final Action* at p. 6. Thus, even if the references were combined, the combination of references fails to teach or suggest all of the recitations of claims 47 and 51. The failure of the references to teach or suggest all of the recitations of claims 47 and 51 precludes a *prima facie* obviousness rejection under 35 U.S.C. § 103(a). *See, In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

Similarly, independent claim 55 recites, in part, “a network of conductors...comprising a first conductive material comprising chromium...the first conductive material forming a sheath completely wrapped around at least a portion of the second conductive material.” Jones et al. admittedly fails to teach a sheath of a first conductive layer wrapped completely around a second conductive layer and Marieb et al. fails to teach or suggest such a wrap comprising chromium as recited in claim 55. The lack of teaching or suggestion of all of the recitations of independent claim 55 precludes a *prima facie* obviousness rejection of claim 55 under 35 U.S.C. § 103(a).

The Final Action also argues that even though Marieb et al. admittedly fails to teach or

suggest a “first part comprising chromium” or a “first conductive material comprising chromium” as recited in claims 47, 51, and 55, incorporation of a chromium-containing material with the structure of Marieb et al. would have been obvious. More precisely, the Final Action alleges “that Marieb et al. describe Ti as the barrier metal for preventing hillocking as an example. Further teaches that instead of sepcific details such as titanium as barrier material or use of aluminum alloy, this invention can be practiced without **these** specific details (lines 58-66 of column 2)[sic.]” *See, Final Action* at p. 6 (emphasis in original). A statement that “this invention can be practiced without these specific details” hardly substitutes for an affirmative teaching or suggestion that chromium be used as a “first part” or as a “first conductive material” as recited in claims 47, 51, and 55. The fact that certain “specific details” of Marieb et al. may be left out of the practice of the invention taught by Marieb et al. does not allow the Office to randomly select a compound from the Applicant’s claims and allege that such a compound may be used in place of those compounds that are affirmatively taught by a reference in support of an obviousness rejection. The fact is that Marieb et al. fails to teach or suggest the use of chromium as a cladding layer. This failure precludes an obviousness rejection of claims 47, 51, and 55 because Marieb et al. fails to teach or suggest all of the recitations of the claims and the combination reference – Jones et al. – does not alleviate the shortcomings of Marieb et al.

The Final Action also alleges that “it is well known in the art that titanium, chromium and tungsten are barrier metal for preventing electromigration (see US 5470788, and US 6406997)[sic.]” *See, Final Action* at p. 6. This statement does not support the outstanding obviousness rejection for two reasons. First, no motivation exists in the references to prevent electromigration in the structures of Jones et al. or to combine Jones et al. with Marieb et al. Second, no motivation exists to use chromium with the Marieb et al. teachings because Marieb et al. does not suggest a need to use chromium. Marieb et al. only teaches cladding layers comprising TiAl_3 , TiN, W, or TiW. *See, Marieb et al.* at col. 3, lines 32-34 and col. 4, lines 30-33. Without some motivation, other than Applicant’s specification which teaches the use of chromium as recited in the claims, chromium would not be substituted for the compounds taught by Marieb et al. The lack of motivation to use chromium with either the structures of Jones et al., Marieb et al., or the combination of the two references, precludes a *prima facie* obviousness

rejection under 35 U.S.C. § 103(a). *See, In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

The combination of Jones et al. with Marieb et al. fails to make obvious independent claims 47, 51, and 55 because there is no motivation to combine Jones et al. with Marieb et al. and because the combination, even if motivated, fails to teach or suggest all of the recitations of independent claims 47, 51, and 55. *See, In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). For at least the foregoing reasons, claims 47, 51, and 55 are not obvious.

Claims 50, 54, and 58 are dependent claims that depend from claims 47, 51, and 55, respectively. As dependent claims of nonobvious independent claims, claims 50, 54, and 58 are also nonobvious. *See*, M.P.E.P. § 2143.03 (citing, *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)(if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious)).

For at least the foregoing reasons, claims 47, 50, 51, 54, 55, and 58 are not obvious and Applicant respectfully requests the withdrawal of the 35 U.S.C. § 103(a) obviousness rejection of those claims.

CONCLUSION

Claims 38, 47, 49 through 51, 53 through 55, 57, and 58 are believed to be in condition for allowance, and an early notice thereof is respectfully solicited. Should the Examiner determine that additional issues remain which might be resolved by a telephone conference, he is respectfully invited to contact Applicant's undersigned attorney.

Respectfully submitted,



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DRJ/sfc:tlp

Serial No. 10/671,332

APPENDIX A



Serial No. 10/671,332

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Ammar Derraa

Serial No.: 10/671,332

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For: MULTILAYER CONDUCTOR FOR
FIELD EMISSION DISPLAY

Confirmation No.: 5696

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(98-0717.01/US)

The present application – U.S. Patent Application No. 10/671,332 – and U.S. Patent 6,657,376 to Raina et al., were, at the time the invention of the present application was made, owned by Micron Technology Inc. Furthermore, the inventor of the present application and the inventors of U.S. Patent 6,657,376 were at all times, including at the time that the invention of the present application was made, obligated to assign all rights in and to the inventions to Micron Technology Inc.

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